

**REMARKS**

**I. Status of the Claims**

Claims 23-48 are pending in this application. No claims are amended herein. Claim 48 is added herein. Support for added claim 48 can be found in the specification and claims as-originally filed, e.g., Specification at Claim 1 and Figures 1-4. Thus, no new matter is presented.

**II. Rejections Under 35 U.S.C. § 103(a)**

A. The Examiner rejects claim 23<sup>1</sup> under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,536,463 to Beals et al. ("Beals") in view of U.S. Patent Application Publication No. 2002/0125413 A1 to Saini ("Saini"). *See Office Action at 2.* Specifically, the Examiner asserts that "Beals discloses a method for installing optical fiber cables in pressurized gas pipelines." *Id.* (citing Beals, Abstract and col. 1, lines 55-60). According to the Examiner, it is well-known that the claim limitations "an optical core comprising a number of telecommunication optical fibers" and "an outer jacket covering the optical core" would be included in the optical fiber cables disclosed in Beals. *See Office Action at 2.* The Examiner, however, concedes that Beals does not disclose the claim limitation "one or more gas leakage detector optical fibers, said one or more gas leakage detector optical fibers being enclosed within the outer jacket." *See Office Action at 2.*

---

<sup>1</sup> In the Office Action, the Examiner rejects claim 1. Applicants believe that this was an inadvertent mistake as claims 1-22 were previously cancelled and replaced with claims 23-47. Thus, Applicants respond to this rejection as if it applied to claim 23.

To attempt to cure this deficiency, the Examiner relies on Saini, which allegedly “discloses a sensor distribution network that uses optical fibers to monitor leak detections over long pipelines such as gas and oil pipelines.” See Office Action at 2. (citing Saini, Abstract and ¶ 48). The Examiner concludes that it would have been obvious to combine Saini’s leak detecting fibers with Beals’ installed optical fiber cables to monitor leaks. See Office Action at 2. The Applicants respectfully traverse this rejection for at least the following reasons.

With respect to obviousness, several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. 467; see also *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

Indeed, to establish a *prima facie* case of obviousness, the Examiner must:

make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention. The tendency to resort to “hindsight” based upon applicant’s

disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

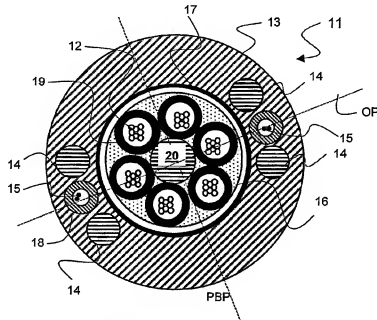
M.P.E.P. § 2142, 8th Ed., Rev. 6 (Sept. 2007). “The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.” *Id.* It is important to note, moreover, that the prior art references relied upon in a rejection “must be considered in its entirety, i.e., as a whole, **including portions that would lead away from the claimed invention,**” when such reasons are articulated by the Examiner. M.P.E.P. § 2141.03(VI), 8th Ed., Rev. 6 (Sept. 2007) (second emphasis added); *see also Graham*, 383 U.S. at 17, 148 U.S.P.Q. 467.

The Examiner has not established a *prima facie* case of obviousness because the claimed invention as a whole would not have been obvious in view of Beals and Saini, when considered as a whole. Specifically, neither Beals nor Saini teaches or suggests the claim limitation of independent claim 23 that the one or more gas leakage detector optical fibers is **enclosed within the outer jacket.** Moreover, Saini teaches one skilled in the art away from enclosing the disclosed optical fibers within an outer jacket because it would have rendered the disclosed invention inoperable.

Claim 23 recites that the “one or more gas leakage detector optical fibers” is **“enclosed within the outer jacket.”** (Emphasis added). The specification explains that the invention solves the “problem of providing a telecommunication optical cable having a **built-in** leakage detecting optical device for promptly and reliably detecting any possible leakage or anomaly in gas pipelines.” Specification at page 4, lines 27-30 (emphasis added). The improved reliability is “obtained by providing an optical fiber

cable wherein the built-in leakage detector comprises one or more optical fibers arranged in the jacket, out of the sealed optical core, preferably rather close to the outer jacket service.” *Id.* at page 4, lines 10-14; *see also id.* at page 9, lines 6-11.

Figure 1, one embodiment of the claimed invention, shows the gas leakage detector fibers 15 enclosed within the outer jacket 13.



**Fig. 1**

*See id.* at Figure 1 and page 13, lines 12-19; *see also id.* at Figure 2, page 17, lines 6-10, and page 18, lines 6-7 (Figure 2 shows that “the gas leakage detector optical fibers 25 are arranged at the periphery of the cable . . .”); Figure 3, page 19, lines 15-20, and page 20, lines 23-24 (same); Figure 4 and page 22, lines 18-23.

In contrast, considering the scope and content of the prior art, neither Beals nor Saini teaches or suggests enclosing the optical fibers of Saini within the outer jacket of Beals. As the Examiner concedes, Beals does not even disclose leakage detector optical fibers. Furthermore, Saini discloses a “sensor distribution network whereby

multiple sensors can be placed along a fiber optic cable.” Saini at ¶ [0007]. Nowhere does Saini teach or suggest enclosing the leakage detector optical fibers within the outer jacket of the cable.

Moreover, Saini must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention. *See* M.P.E.P. 2141.02(VI); *see also Tec Air, Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353, 1360, 52 U.S.P.Q.2d 1294 (Fed. Cir. 1999) (“There is no suggestion to combine, however, if a reference teaches away from its combination with another source.”). Because enclosing the optical fiber of Saini within an outer jacket would destroy or negate its intended purpose, the motivation to make the Examiner’s suggested modification is lacking. *See, e.g., In re Fritch*, 972 F.2d 1260, 1265 n.12, 23 U.S.P.Q.2d 1780, 1783 n.12 (Fed. Cir. 1992) (“A proposed modification [is] inappropriate for an obviousness inquiry when the modification render[s] the prior art reference inoperable for its intended purpose.”); *Application of Ratti*, 270 F.2d 810, 813, 123 U.S.P.Q. 349, 352 (C.C.P.A. 1959) (no motivation to make suggested combination of references under § 103 because it “would require a substantial reconstruction and redesign of the elements shown in [the prior art reference] as well as a change in the basic principles under which [that reference’s] construction was designed to operate”).

Saini’s method for monitoring target species, such as hydrocarbons, requires that the disclosed fiber optic cable be immediately exposed to the medium that contains the target species, *i.e.*, not be enclosed within an outer jacket. *See* Saini, ¶ [0021] (“[T]he invention provides for a single fiber optic cable, capable of having thereon a plurality of sensor devices . . . .”) (emphasis added). For example, Saini’s sensor devices have a

Bragg grating, which reflects light at a particular wavelength. *See id.* “A change in the property, such as intensity, of light as a result of the presence of the target species can easily be determined by measuring the wavelength of that light, and knowing the position of the particular Bragg grating which reflects the light wavelength.” *Id.* “In determining the presence of the target species, the photodetector or associated instrumentation measures the intensity of light being transmitted through the optical fiber.” *Id.* at ¶ [0045]. Saini explains that the sensor is positioned in a location best suited to monitor target species “within the medium in which it is located.” *Id.* at ¶ [0066] (emphasis added). Therefore, in the case of monitoring hydrocarbons in the atmosphere, for example, the sensors present on the fiber optic cable of Saini must be placed in direct and intimate contact with air, namely, in contact with the medium in which a pollutant may be released.

More specifically, the cable of Saini is not intended to be installed in a gas pipeline. For example, Saini discloses that the optical fiber “may typically run adjacent an oil or gas pipeline or some other form of construction which requires monitoring for pollutants, such as hydrocarbons.” *Id.* at ¶ [0061] (emphasis added). In other words, the cable of Saini is intended for installation outside (adjacent to) a gas pipeline, not inside a gas pipeline.

In contrast to Saini’s method for monitoring target species, the “distributed optical fluid (typically gas) leakage detection method according to the present invention, . . . relies on the principle that a localized temperature change affects the transmission characteristics of an optical fiber.” Specification at page 8, lines 13-16. “The distributed fiber optical temperature sensing technique is based on the RAMAN effect and the so-

called Optical Time Domain Reflectometry (OTDR) technique." *Id.* at page 8, lines 18-20. Therefore, unlike the method used by Saini, the method used by the claimed invention to detect gas leakages does not require that the claimed gas leakage detector optical fibers be in direct and intimate contact with the medium.

If the optical fibers of Saini were enclosed within an outer jacket of the claimed invention, the method disclosed by Saini to monitor target species such as hydrocarbons would be entirely frustrated. Accordingly, one skilled in the art would not have been motivated to enclose the fiber optic cables of Saini within an outer jacket.

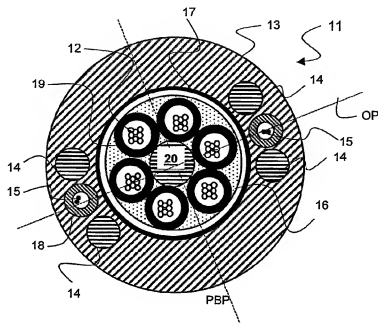
Applicants, therefore, respectfully submit that the rejection is in error and should be withdrawn.

B. The Examiner rejects claims 24-47 under 35 U.S.C. § 103(a) as being unpatentable over Beals in view of Saini. *See* Office Action at 2-4. Applicants respectfully traverse this rejection for at least the following reasons.

Claim 23 is not rendered obvious by the combination of Beals and Saini for the reasons discussed above. Because claims 24-47 depend, either directly or indirectly, from claim 23, Applicants respectfully submit that the Examiner's rejection should be withdrawn for at least the same reasons.

C. Claim 48 is added herein and recites that the at least one leakage detector optical fiber is enclosed within the outer jacket and separated from the optical core. For example, Figure 1, one embodiment of the claimed invention, shows the gas leakage

detector fibers 15 enclosed within the outer jacket 13 and separated from the optical core 16 by metal barrier 17.



**Fig. 1**

See, e.g., Specification at Figure 1 and page 13, lines 12-19.

In contrast to the claimed invention, the specification notes that “the prior art arrangements used to place the distributed gas leakage detector within the sealed optical core, thus showing low sensitivity and delayed response-time performances.” *Id.* at page 9, lines 11-14 (emphasis added). Moreover, as the Examiner concedes, Beals does not even disclose leakage detector optical fibers. Furthermore, Saini discloses a “sensor distribution network whereby multiple sensors can be placed along a fiber optic cable.” Saini at ¶ [0007]. Nowhere does Saini teach or suggest enclosing the leakage detector optical fibers within the outer jacket of the cable and separated from the optical core.

Accordingly, neither Beals nor Saini teaches or suggests enclosing the at least one leakage detector optical fiber within the outer jacket and separating it from the optical core. Further, neither Beals nor Saini provides any motivation for doing so. Therefore, Applicants respectfully submit that added claim 48 is patentable over Beals and Saini.

### **III. Conclusion**

In view of the foregoing remarks, Applicants submit that the claimed invention is neither anticipated nor rendered obvious in view of the prior art references cited against this application.

If the Examiner believes a telephone conference could be useful in resolving any of the outstanding issues, he is respectfully urged to contact Applicants' undersigned counsel at 202-408-4152.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: January 7, 2008

By: 

Aaron M. Raphael  
Reg. No. 47,885